Self Cleaning Filter

FILTER CONCEPT®
www.filter-concept.com

Self-cleaning filter is used for preliminary filtration of demanding applications of various industries. They are very useful for applications where suspended solid load is comparatively high. They are also useful for filtration of highly viscous material and slurry-based filtration applications. Their working principle is based on the differential pressure parameters across the filter. One can set a clean pressure drop and a change-out pressure drop for uninterrupted filtration. They are available in the following three types:

- Auto Back Wash Type Filter
- Scrapper Mechanism Filter
- Disc Type Filter

Back Wash Type

Construction

Back wash type self-cleaning filter is constructed of filter housings, filter elements, drain valve, auto back wash valve and PLC controller. Filter housings can be offered in various materials of construction such as various grades of stainless steel, carbon steel and alloy metal. Filter elements can be offered with wedge wire, sintered multi-layer wire mesh, plain wire mesh and sintered metal powder configuration. They are selected based on the requirement of filtration quality. For 100 microns and more, normally it is recommended to use wedge wire element. From 2 microns to 100 microns, it is advisable to use sintered multi-layer wire mesh and plain wire mesh, depending upon the application requirement. For final filtration of 0.2 microns to 5 microns, sintered metal powder is a suitable filter media. Customers can use pneumatically or electrically operated butterfly valve or ball valve as per their process requirement. Normally our systems are equipped with pneumatically operated solenoid valves for back washing and draining. Control panels can be offered with FLP (flame proof) and non-FLP, depending upon the process requirement.

Operation

Back wash type self cleaning filters work on a flow direction of outside to inside. Unfiltered fluid enters into filter housing through bottom tangential inlet connection. Contaminants are deposited on the outer surface of filter elements and clean filtrate passes through inside diameter of element and removed through the top tangential outlet. Users can set their differential pressure data within control panel. Once the differential pressure across the system reaches the pre-defined level of pressure drop, inlet and outlet valves shut down and the drain and backwash valves open for defined interval of time. During this process, debris deposited on outer surface of element shall be drained out and collected through bottom drain. This cycle continues as per pre-defined settings and process requirements.

Features and Benefits

- High filtration accuracy, stable filtrate quality and supply.
- Due to its own search and emergency operation function, self cleaning filter can do automatic back-washing and can cope with volatile fluctuations without manual intervention.
- Filtration equipment control system is unique and has a precise operation, which is to adjust back-washing pressure setting according to different sources and filtration accuracy in a flexible way.
- The system has high efficiency and strong recovery. Its cartridge can be used for longer period without replacement.
- During the back-washing process, each cartridge operates in turn and meanwhile the other cartridges continue the filtration process without being affected.
- Self cleaning filter ahas a drain valve, which has a short-back-washing facility and consumes less water, thereby saving water, power and energy source.
- Reasonable and compact structural design.
- No consumable material, low operation and maintenance cost, simple operation and management.

.

Scrapper Mechanism

Construction

Its construction is similar to back wash type self cleaning filter except that it does not have an auto back wash valve. Also, sintered metal powder filter media is not an option in the scrapper type filter. In addition, it has a scrapper mechanism which is operated by a geared motor.

Operation

The medium to be cleaned is guided into the filter by inlet, which passes from inside to outside through the cartridge gap. After filtration, the filtered fluid exits the filter housing and the bigger solids are separated on the surface of the triangular cartridge wires. When it runs for a certain time, the cartridge gap gets plugged up by impurities and meanwhile the differential pressure reaches its pre-set value. Then PLC inspects the signal and sends out the indication. The gear motor drives the scraper and the particles or agglomerates are skimmed from the surface, thereby keeping the function of cartridge well and keeping the cartridge gap clean.

When the impurities at the bottom of the filter increases, the drain valve opens up and the impurities are emptied successfully, which makes the system pressure achieve normality. Because of well-set position and optimum scraping angle, the rotational scraper drains off the impurities from the filter with the help of the gear motor. This avoids the burden of taking apart the cartridge and washing it, which results into successful filtration of the medium. The scraper system contains stator, PTFE scraper and spring, which are designed for automatic cleaning.

Features and Benefits

- Because of automatic continuous on-line filtration, the filtration process becomes smooth.
- The gear motor runs against the spring actuated scraper and the concentrated solids are drained off by the system, thereby keeping the function of the cartridge well.
- PLC control function means differential-pressure cleaning, scheduling of cleaning process and manual cleaning. The differential-pressure is an important parameter for operation and can be connected with the central control room.
- Validated by practice, this filtration process is highly effective and using the wedge cartridge, it can be easily cleaned with less abrasion.
- In many fields, this filter can replace the traditional filters like sand filters, Filter press etc.

Disc Type

Construction

The construction of disc type self-cleaning filter is similar to the back wash type except that it does not have an auto back wash valve and PLC controller, but instead it has a pneumatic cylinder and timer-based drain valve.

Operation

A spring-loaded cleaning disc moves up and down inside the filter screen and removes collected contaminants. The filtrate flows from top to bottom, and from inside of the screen to outside. The contaminants that are collected on the screen are easily removed and evacuated to the collection chamber. On the downstroke, any remaining contaminants are driven downwards to the collection chamber while on the upstroke, the cleaning disc removes contaminants from the screen surface.

Features and Benefits

- No replacement costs for filter screen and no disposal expenses.
- Disc type clean permanent cartridge.
- Reduces the risk of operators in contact with the dangerous material.
- Reduces the environmental pollution.
- Reduces the labor demands and no more filter screen changeouts. - -
- Increases profitability, improves overall system efficiency, and reduces downtime.
- Longer life, higher accuracy, higher erosion resistance.
- Space-saving design, small and compact footprint.
- Collection and removal of contaminant from fluid being filtered, without any interruption in the operation.

Applications

- Domestic water supply
- Reverse osmosis
- softening
- Ion exchange and other pretreatment
- Oil field
- Paint & Inks
- Solvents
- Chemicals
- Latex
- Adhesive
- Lubricants
- Tooth Paste
- Glycol
- Cooling water
- Reclaimed water
- Ground water
- Surface water turbidity removal purification
- Boiler backwater
- Swimming pools
- Landscape water
- Green spray
- Agriculture irrigation water